

[On-Board Diagnostic Catalyst Monitoring System]

Abstract of Disclosure

A method for determining the effectiveness of a catalyst to remove emissions from the exhaust of an internal combustion engine. The method includes measuring an upstream time history of a signal produced by an exhaust gas oxygen sensor upstream of the converter and a time history of an exhaust gas oxygen sensor disposed downstream of the converter. The time histories vary between a lean air-fuel ratio signal level and a rich air-fuel ratio signal level. A time delay is determined between the upstream time history and the downstream time history during transitions in such time histories from the lean air-fuel ratio signal level to the rich air-fuel ratio signal level. The determined time delay is compared with a reference time delay to determine the efficiency of the converter. The converter is determined to be ineffective if the converter has been determined to be potentially ineffective and the time delay is determined to be less than the reference time delay.

Figures

Figure 1: A plot of the time evolution of the system. The x-axis represents time t and the y-axis represents the position x . The plot shows a periodic oscillation around a central value.

Figure 2: A plot of the time evolution of the system. The x-axis represents time t and the y-axis represents the position y . The plot shows a periodic oscillation around a central value.

Figure 3: A plot of the time evolution of the system. The x-axis represents time t and the y-axis represents the position z . The plot shows a periodic oscillation around a central value.

Figure 4: A plot of the time evolution of the system. The x-axis represents time t and the y-axis represents the position x . The plot shows a periodic oscillation around a central value.

Figure 5: A plot of the time evolution of the system. The x-axis represents time t and the y-axis represents the position y . The plot shows a periodic oscillation around a central value.

Figure 6: A plot of the time evolution of the system. The x-axis represents time t and the y-axis represents the position z . The plot shows a periodic oscillation around a central value.

Figure 7: A plot of the time evolution of the system. The x-axis represents time t and the y-axis represents the position x . The plot shows a periodic oscillation around a central value.

Figure 8: A plot of the time evolution of the system. The x-axis represents time t and the y-axis represents the position y . The plot shows a periodic oscillation around a central value.

Figure 9: A plot of the time evolution of the system. The x-axis represents time t and the y-axis represents the position z . The plot shows a periodic oscillation around a central value.

Figure 10: A plot of the time evolution of the system. The x-axis represents time t and the y-axis represents the position x . The plot shows a periodic oscillation around a central value.